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ABSTRACT

A reliability analysis was conducted of an abbreviated, 10-item version of the Pupil Control Ideology Form (PCI), using the Cronbach's alpha technique (L. J. Cronbach, 1951) and the computation of the standard error of measurement. The PCI measures a teacher's orientation toward pupil control. Subjects were 168 preservice teachers from one private and one public college and 86 inservice teachers attending one private and one public college in south Florida. Cronbach's alpha is a special statistical measure that provides an estimate of the internal consistency of a test. Coefficient alpha is interpreted like a split-half coefficient and estimates the average split-half correlation from all possible divisions of a test. The higher the score on Cronbach's alpha, the better the evidence that items on the instrument are measuring the same trait. Preservice teachers from the private college had a Cronbach's alpha of 0.61 while their inservice counterparts had a Cronbach's alpha of 0.70. Preservice teachers at the public college had a Cronbach's alpha of 0.74 and their inservice counterparts had a coefficient alpha of 0.70. Results suggest that the abbreviated PCI is not as reliable as the original, although results are considered to be of a satisfactory level of reliability. The abbreviated PCI also requires less time for administration. An appendix presents the abbreviated PCI. (Contains 64 references.) (SLD)

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A Test Reliability Analysis Of An Abbreviated Version Of The Pupil Control Ideology Form

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The Purpose Of The Study

The primary purpose of this investigation is to conduct a reliability analysis of an abbreviated (10-item) version of the Pupil Control Ideology Form (hereafter called the PCI Form), using the Cronbach's alpha technique and the computation of the standard error of measurement, with samples of preservice and inservice teachers situated within south Florida. Reliability analysis assumes that test scores reflect the influence of two factors: (1) stable characteristics of the individual (called true characteristics) and (2) chance features of the individual or the situation (called random measurement error). The focus of reliability analysis is thus the degree to which test scores reflect true score or true knowledge and characteristics, rather than the effects of random errors of measurement (Friedenberg, 1995).

Following a comprehensive review of mainly the periodical literature, i.e., 66 studies covering the period of time from 1963 through 1996, this author found no previous research that reported further on the test reliability or the standard error of measurement of the abbreviated version of the PCI Form beyond the original studies conducted by Graham, Benson, and Henry (1985) and Graham, Halpin, Harris, and Benson (1985). As a result it is felt that this investigation will make a worthwhile contribution to current and future efforts at developing enhanced understanding about the measurement of the construct of pupil control ideology.

Reliability, along with validity, are central issues in all scientific measurement. Furthermore, both reliability and validity are salient within social research because social theory constructs are often ambiguous, diffuse, and not directly observeable (Neuman, 1997). In particular, reliability is a necessary property for any measurement procedure to have (Thorndike, 1997). Furthermore, reliability is a major consideration in evaluating any scale (Salvia & Ysseldyke, 1991), and it must be carefully considered in selecting tests for use within research (Gall, Borg, & Gall, 1996).

Thorndike (1997) argues that there is no single value that represents the correct reliability of a test. The observed reliability of an instrument is a function of the properties of the underlying trait, the scale itself, the group being tested, and the situation in which

information about reliability is obtained. Mason and Bramble (1989) contend that when an established measure is used in research the application, setting, or purpose might change the test, thus resulting in a need for studying reliability within the context of the research being conducted. They also state that even in situations where a scale is being utilized in the manner in which it was designed, problems with reliability may still arise. Sprinthall (1994) warns us to always keep firmly in mind that reliability refers to a certain instrument applied to a certain population under certain conditions. Finally, Vockell and Asher (1995) point out that any measurement device that is reliable in one setting or for one purpose may be unreliable in another setting or for a different purpose. They add that establishing that our data collection processes are reliable is an important step in the process of public, scientific thinking.

The standard error of measurement is also seen as being important to consider when selecting an instrument for research investigations (Mason & Bramble, 1997). In addition to reliability, the American Psychological Association requires test publishers to report standard error of measurement information for tests offered for public use (Thorndike, 1997). In particular, the 1985 Standards for Educational and Psychological Testing calls for test developers and publishers to furnish consumers information about the standard error of measurement of their scales (Drummond, 1996).

Test Reliability

Reliability is defined as the degree to which test scores are consistent, dependable or repeatable, and it is a function of the degree to which such scores are free from errors of measurement (Drummond, 1996). Reliability indicates the extent to which individual differences in test scores are attributable to true differences in the characteristics under consideration and the extent to which they are attributable to chance errors (Anastasi, 1988). Reliability means that information provided by an instrument does not vary as a result of characteristics of the scale itself (Neuman, 1997).

No test is a perfectly reliable instrument (Anastasi, 1988), however, the less reliable a measure is then the greater the discrepancy is between obtained scores and true scores (Salvia &

Ysseldyke, 1991). Getting unreliable measurement virtually guarantees inaccuracy (Mitchell & Jolley, 1992). Moreover, there is no single reliability for a test. Any scale can be evaluated in several different ways with each way providing its own estimate of a particular type of reliablity (Friedenberg, 1995). The typical procedures for estimating reliability include (1) the test-retest method, (2) the parallel-forms method, (3) the split-half method, and (4) the internal-consistency methods (Ferguson, 1981).

The Reliability Coefficient

Reliability is represented statistically as a correlation called a reliability coefficient and is essentially defined as a variance proportion. It indicates the proportion of true score variance or the proportion of test score variance attributable to true score differences. The remaining proportion of test score variance, called error score variance, reflects the proportion of differences due to measurement error (Friedenberg, 1995). Thus a reliability coefficient is defined as the ratio of variance in true scores to variance in observed scores (Mason & Bramble, 1997). If there is relatively little error, then the ratio of true-score variance to obtained-score variance approaches a reliability index of 1.00 (perfect reliability). On the other hand, if there is relatively a large amount of error, then the ratio of true-score variance to obtained-score variance approaches a reliability index of 0.00 (total unreliability). A reliability coefficient serves the three major functions of (1) estimating an instrument's relative freedom from measurement error, (2) estimating an individual subject's true score, and (3) finding the standard error of measurement (Salvia & Ysseldyke, 1991).

The Relationship Of Reliability To Validity

For a test to be valid, it must also be reliable. Reliability is a necessary precondition for validity. No scale can measure what it purports to measure unless it is reliable, and no obtained or observed score is interpretable unless it is also reliable (Salvia & Ysseldyke, 1991). In short, reliability puts a ceiling on validity in the sense that the more reliable a measurement device then the greater the opportunity or potentiality for validity (Mitchell & Jolley, 1992).

Measures Of Internal Consistency

Internal consistency procedures are the most widely used estimates of test score reliability (McMillan, 1992). Internal consistency, or the method of rationale equivalence (Hittleman & Simon, 1992), is an approach to estimating reliability in which the individual items on an instrument are examined. It involves an analysis of scores from a sample of individuals following one administration of a scale (Gall, Borg, & Gall, 1996). In this approach an estimate of the reliability of the total measure is developed from an analysis of the statistics of the individual items (Thorndike, 1997). Internal consistency involves looking at the consistency or stability of performance among the items occurring within a test (Mason & Bramble, 1997). Equivalence reliability applies when multiple indicators are used in the operationalism of a construct (Neuman, 1997).

Internal consistency procedures work best with an instrument measuring a single construct, domain, trait, or subject (Drummond, 1996). An internally consistent test is homogeneous, i.e., all test items are drawn from the same domain and are in fact tapping the same area of knowledge or personal characteristics (Friedenberg, 1995). In essence a scale is homogeneous in the sense that every item measures the same general trait of ability or personality as every other item (Thorndike, 1997). In all internal consistency analyses the source of error is the differences in test items. The error factor indicates the degree to which such items are heterogeneous rather than homogeneous. Thus lack of homogeneity implies that all test items are not necessarily tapping the same knowledge or personal characteristcis, i.e., they are not drawn from the same domain (Friedenberg, 1995). Homogeneous measurement devices are to be preferred because their scores permit fairly unambiguous interpretation (Anastasi, 1988).

Cronbach's Coefficient Alpha

Cronbach's alpha, a frequently utilized method for computing reliability (Kubiszyn & Borich, 1993), is a special statistical measure used to provide an estimate of the internal consistency of a test (Cronbach, 1951). Coefficient alpha is a general form of the Kuder-Richardson Formula 20 that can be employed when items on a

measure are not scored dichotomously (Gall, Borg, & Gall, 1996). Cronbach's alpha is generally considered the most appropriate type of reliability for attitude instruments and other scales that contain a range of possible answers for each item (McMillan, 1992), are unidimensional in nature (Vockell & Asher, 1995), and test a narrow domain (Friedenberg, 1995). In fact because of the ready availability of computers, coefficient alpha has become the preferred statistic for obtaining an estimate of internal consistency (Cohen, Swerdlik, & Phillips, 1996).

Coefficient alpha is interpreted like a split-half coefficient and estimates the average split-half correlation from all possible divisions of a test (Friedenberg, 1995). The higher the score on Cronbach's alpha then the better the evidence that items on the instrument are measuring the same trait (Leedy, 1997). Coefficient alpha generates a more conservative estimate of a scale's internal consistency because it compares performance on each item to performance on all other items (Friedenberg, 1995). Both content sampling and content heterogeneity are treated as error variance by Cronbach's alpha, i.e., interitem consistency is influenced by two sources of error variance: (1) the sampling of the content and (2) the heterogeneity of the behavior domain sampled (Anastasi, 1988).

Measurement Error

In classical test theory, one assumption is that each subject has a true score on an instrument which is his/her actual amount of the characteristic in question. The second assumption is that any test of this characteristic is likely to have a certain amount of measurement error. The third assumption is that these errors of measurement are randomly distributed and unspecifiable. It follows from this analysis that any observed score obtained by administering a scale will contain a combination of both a true score component and an error score component. Thus one can define measurement error as the difference between an individual's true score on a test and the scores that he/she actually obtains on it over a variety of conditions (Gall, Borg, & Gall, 1996).

The measurement of human behavior is particularly susceptible to inconsistency, and some degree of inconsistency is present in all measurement procedures (Thorndike, 1997). Therefore,

all test scores reflect some measurement error (Friedenberg, 1995). To estimate the amount of measurement error associated with an instrument's score two statistics are needed: (1) a reliability coefficient and (2) the standard error of measurement (Salvia & Ysseldyke, 1991). Because any test is made with some measurement error, reliability may be viewed as an instrument's relative freedom from such error (Thorndike, 1997). If a scale has high reliability then it has relatively little measurement error, and if it has low reliability then there is a relatively large amount of measurement error (McMillan, 1992).

The Standard Error Of Measurement

Because of the presence of measurement error, there is always some uncertainty about an individual's true score. The standard error of measurement (also called the standard error of a score) provides information about the certainty with which an individual's test score can be interpreted (Salvia & Ysseldyke, 1991) and provides an index of nonsystematic sources of variance (Wilkinson & McNeil, 1996). The standard error of measurement serves to remind one that the scores obtained on instruments are only estimates and may be considerably different from individuals' presumed true scores (Gall, Borg, & Gall, 1996).

The standard error of measurement is defined as the standard deviation of error scores or the standard deviation of test scores around true scores (Friedenberg, 1995). Stated in another way, the standard error of measurement is the standard deviation that would be obtained for a series of measurements taken on the same individual (Thorndike, 1997). The standard error of measurement tells the probable score range within which an individual's true score may fall, and the range variability of an individual's score is a function of an instrument's reliability (Drummond, 1996). The standard error of measurement is regarded as the best index of the consistency one can expect for individual scores (Thorndike, 1997).

The standard error of measurement and the reliability coefficient are alternative ways of expressing test reliability (Anastasi, 1988). In fact the standard error of measurement uses a reliability coefficient to determine and indicate the average amount by which test scores and true scores differ or the average number of

test score points attributable to random error (Friedenberg, 1995). As a reliability coefficient decreases the standard error of measurement increases, and as the standard deviation increases the standard error of measurement increases (Salvia & Ysseldyke, 1991).

The Original Pupil Control Ideology Form

According to Anderson (1982), the PCI Form is one of the major instruments used by researchers interested in the study of school climate and represents a unique thread within such research, possessing both anthropological and psychological roots. Graham, Benson, and Henry (1985) point out that the PCI Form has played an important role in the study of human behavior in schools. Gaffney and Byrd-Gaffney (1996) contend that research involving the PCI Form enjoys a rich theoretical and empirical tradition and has made a significant contribution to how one can perceive the nature of schools, in particular their culture or climate and the social, psychological, and political dynamics operating within them. The PCI Form has been used in an extensive number of studies involving preservice teachers, inservice teachers, counselors, and principals and encompassing a myriad of variables. Moreover, the PCI Form has been utilized in numerous international and cross-cultural studies.

The original PCI Form, using a summated rating scale, is a self-report instrument developed by Willower, Eidell, and Hoy (1967). It consists of 20 five-point Likert-type declarative statements, representing various facets of school life, used to measure an educator's orientation toward pupil control along a bipolar custodial-humanistic continuum. Responses on this paper-and-pencil instrument are scored from 5 points (Strongly Agree) to 1 point (Strongly Disagree), with scoring reversed on the only two items, 5 and 13, positive toward the humanistic viewpoint. The theoretical scoring range on this measure is from 20 to 100. The higher the overall score is then the more custodial the pupil control ideology, while the lower the overall score is then the more humanistic the pupil control orientation. The PCI Form is regarded as a relatively simple, nonthreatening, and easy-to-administer instrument (Foley & Brooks, 1978). Administration time for the PCI Form has been reported to be approximately 15 minutes in length (Harty & Hassan, 1983).

Examples of items found on the PCI Form include: "A few pupils are just young hoodlums and should be treated accordingly."; "It is often necessary to remind pupils that their status in school differs from that of teachers."; and "Pupils can be trusted to work together without supervision." (score reversed). Factor analytic procedures, employed by Graham, Halpin, Harris, and Benson (1985) with a sample of undergraduate and graduate education students and by Graham, Benson, and Henry (1985) with a sample of primary and intermediate level teachers, revealed a unidimensional scale with one total score, thus attesting to the PCI Form's construct validity.

Based upon an adaptation to public schools of a typology employed by Gilbert and Levinson (1957) in their study of the control ideology of mental hospital staff members concerning patients, Willower, Eidell, and Hoy (1967) developed prototypes of custodial and humanistic orientations toward pupil control as measured by the PCI Form. Control ideology is conceptualized as a bipolar continuum ranging from "custodialism" at one extreme to "humanism" at the other extreme. These ideological extremes constitute analytic abstractions or "ideal types" in the sense that Max Weber used the term, i.e., they represent pure types not necessarily found in such form within experience. Thus an individual's pupil control orientation may fall anywhere between these two extremes. The concepts of humanistic and custodial pupil control ideologies are used to contrast types of educators' individual orientations and the types of school organizations that they seek to rationalize and justify. A description of each prototype, based on Willower, Eidell, and Hoy (1967), is thus presented.

The prototype of the custodial orientation is the rigidly traditional school. A highly controlled setting concerned primarily with the maintenance of order is provided by this type of organization. Students tend to be stereotyped in terms of their appearance, behavior, and parents' social status, and they are perceived as irresponsible and undisciplined persons who must be controlled through punitive sanctions. In this type of school teachers do not attempt to understand student behavior, but rather view it within moralistic terms. Student misbehavior is perceived as a personal affront, and relationships with pupils are maintained on an impersonal basis. Both pessimism and watchful mistrust permeate the school atmosphere created by the custodial viewpoint.

Teachers possessing a custodial ideology view the school as an autocratic organization with rigidly maintained distinctions between the status of teachers and that of students. In such a setting both power and communication flow unilaterally and downward, and students are expected to accept the decisions of teachers without question. Both teachers and students feel responsible for their actions only to the extent that orders are carried out to the letter. In brief, rigid control of students is the central concern. The custodial school, with its patent emphasis on subordination of students and dominance of teachers, is a typical social structure found in many schools (Deibert & Hoy, 1977).

The school as an educational community in which students learn through cooperative interaction and experience serves as the prototype of the humanistic ideology. Such an orientation is used in the socio-psychological sense suggested by Fromm (1948), i.e., it stresses the importance of the individuality of each student and the creation of an atmosphere to meet the wide range of student needs. Both students' learning and behavior are looked upon in sociological and psychological terms, as opposed to moralistic terms. Learning is perceived as an engagement in worthwhile activities rather than the passive absorption of facts. The withdrawn student is seen as a problem equal to that of the overactive, troublesome one. The humanistic teacher is optimistic that, through close personal relationships with pupils and the positive aspects of friendship and respect, student self-discipline will be substituted for strict teacher control.

Teachers holding a humanistic ideology tend to desire a democratic classroom atmosphere with its attendant flexibility in status and rules, open channels of two-way communication, sensitivity to others, and increased student self-determination. Both teachers and students alike are willing to act upon their own volition and to accept responsibility for their actions. A humanistic pupil control orientation is positively associated with all that is desired in a "healthy" organization (Foley & Brooks, 1978), and the key to such an ideology is the teacher (Lunenburg & O'Reilly, 1974).

Willower, Eidell, and Hoy (1967) reported split-half reliability coefficients, corrected by the Spearman-Brown prophesy formula, for the PCI Form of .95 (N=170) and .91 (N=55). Both samples involved a

combination of elementary and secondary school faculty members. They concluded that the PCI Form was a relatively reliable measure of educators' pupil control ideology.

Concerning previous studies with preservice teachers regarding the PCI Form's test reliability, Halpin, Goldenberg, and Halpin (1974) computed a stability (test-retest) coefficient of .86 for prospective teachers covering a seven-day interval of time. Harty, Andersen, and Enochs (1984) calculated coefficient alphas of .71 and .76 for samples of preservice elementary school teachers. Graham, Halpin, Harris, and Benson (1985) found a coefficient alpha of .90 for a sample of undergraduate and graduate education students. Woolfolk and Hoy (1990) computed a coefficient alpha of .72 with a sample of prospective teachers. Hoy and Woolfolk (1990) calculated a coefficient alpha of .72 for a sample of preservice elementary and secondary school teachers and noneducation undergraduate students. Finally, Enochs, Scharmann, and Riggs (1995) reported a Cronbach's alpha of .75 utilizing a sample of prospective elementary school teachers.

Regarding past research with inservice teachers concerning the test reliability of the PCI Form, Bruan and Cook (1984) found an internal consistency coefficient of .91 for a sample of elementary school teachers. Harris, Halpin, and Halpin (1985) reported a coefficient alpha of .89 for a sample of teachers. Kottkamp and Mulhern (1987) computed an alpha reliability of .77 with a sample of high school teachers and based upon school mean scores. Finally, Eshel and Kurman (1990) found a coefficient alpha of .66 for a sample of elementary school teachers.

An examination of the previously reported reliability coefficients for the PCI Form shows that coefficient alpha was the statistical procedure used most often in their calculation and that such coefficients tend to run considerably lower for preservice teachers (Mean=.77) when compared to inservice educators (Mean=.85). As Woolfolk and Hoy (1990) suggest, lower reliability coefficients on the PCI Form for prospective teachers appear to be understandable in light of the fact that these subjects probably have not had extensive teaching experiences. This situation would thus limit their individual and collective exposure to pupils. In addition, this situation would also tend to result in a relatively homogeneous

or restricted group when compared to inservice teachers. There is less variability of scores in a homogeneous group of subjects (Drummond, 1996). Group variability affects the size of a reliability coefficient in that lower reliability coefficients result from groups that are more homogeneous rather than heterogeneous in nature (Kubiszyn & Borich, 1993).

Furthermore, higher reliability coefficients on the PCI Form for inservice teachers seems logical when one considers that they were essentially the population on which this instrument was originally developed. This point is underscored in part by the fact that in most studies the PCI Form has been generally administered to classroom teachers (Graham, Benson, & Henry, 1985). In this author's review of predominantly the periodical literature covering 1963 through 1996, 77% (51 out of 66) of the studies with the PCI Form dealt with inservice teachers.

In studies examining pupil control ideology and pluralistic ignorance, Packard and Willower (1972) computed split-half reliability coefficients for the PCI Form, corrected by the Guttman formula, ranging from .85 to .91. These estimates of internal consistency were found with a sample of elementary and secondary school teachers, counselors, and principals and included PCI Forms responded to from the perspective of both personal orientations toward pupil control and the perceived ideologies toward such control on the part of other position incumbents within the school setting. In a similar type of investigation, Vitagliano and Licata (1987) reported alpha reliability coefficients ranging from .69 to .89, with a mean coefficient of .79, for the PCI Form filled out on both oneself and others. This study involved both elementary and secondary school hearing and nonhearing teachers working within a residential school for the deaf.

The preceeding discussion concerning the reliability of the PCI Form generally supports the adequacy of this scale for use in research with both preservice and inservice educators. For the most part the majority of reported reliability coefficients fall within the range of acceptable or satisfactory values for this type of attitudinal measure that have been delineated by Helmstadter (1964), Salvia and Ysseldyke (1991), McMillan (1992), Leedy (1997), and Patten (1997). This is especially true in the case of inservice teachers.

Although the PCI Form is a measure of control ideology as opposed to control behavior, it seems reasonable to expect that ideology will, to some degree, be reflected in behavior (Lunenburg & Schmidt, 1989) and that one function of ideology is that of structuring behavior, i.e., providing an internal guide to action (Helsel, 1971a). In fact, there is some empirical evidence that educators' pupil control ideology and their pupil control behavior are positively and significantly related to each other (Helsel & Willower, 1974). Nevertheless, the vast majority of studies dealing with pupil control have traditionally focused upon ideology rather than behavior (Lunenburg & Schmidt, 1989; Silver, 1983; Willower, 1975).

Willower (1975) points out that no attempt has been made to standardize the PCI Form since this instrument is commonly viewed as a research rather than a diagnostic tool. Furthermore, the PCI Form is seen as being both time and place bound. Thus socioeconomic changes over time are likely to be reflected in changes in the distribution of PCI Form scores (Graham, Halpin, Harris, & Benson, 1985).

In terms of possible refinements and modifications of the PCI Form, Willower (1975) notes that societal changes have tended toward more humanistic orientations which have been reflected in both preservice and inservice teacher training programs. Thus some items found on the PCI Form, e.g., "Directing sarcastic remarks toward a defiant pupil is a good disciplinary technique.", may be so at odds with current educational thought that a demand effect occurs. Teachers may hesitate to concur with such a statement because of the prevalent values of their milieu, even if their pupil control ideology tends to be custodial. Thus updating this instrument through the development and field testing of new items is recommended (Graham, Halpin, Harris, & Benson, 1985). Furthermore, 18 of the 20 items on the PCI Form are worded from the custodial point of view. A more even mix of items worded from both the humanistic and custodial perspectives could be beneficial in avoiding response bias. Graham, Halpin, Harris, and Benson (1985) suggest that this could be accomplished through the construction of new items.

The Abbreviated Version Of The PCI Form

Graham, Halpin, Harris, and Benson (1985) recommend for possible consideration in future research the use of a 10-item, one factor PCI Form consisting of items 9, 10, 11, 12, 13, 14, 16, 17, 19, and 20. These items include the following five-point Likert-type declarative statements:

*9. Too much pupil time is spent on guidance and activities and too little on academic preparation.
*10. Being friendly with pupils often leads them to become too familiar.
*11. It is more important for pupils to learn to obey rules than that they make their own decisions.
*12. Student governments are a good "safety valve" but should not have much influence on school policy.
*13. Pupils can be trusted to work together without supervision.
*14. If a pupil uses obscene or profane language in school, it must be considered a moral offense.
*16. A few pupils are just young hoodlums and should be treated accordingly.
*17. It is often necessary to remind pupils that their status in school differs from that of teachers.
*19. Pupils cannot perceive the difference between democracy and anarchy in the classroom.
*20. Pupils often misbehave in order to make the teacher look bad.

Like the original PCI Form, this self-report instrument uses a summated rating scale, and responses on this paper-and-pencil measure are scored from 5 points (Strongly Agree) to 1 point (Strongly Disagree). Scoring is reversed on item 13 which is positive toward the humanistic point of view. The theoretical scoring range for this scale ranges from 10 to 50. The higher the overall score is then the more custodial the pupil control ideology. This author found the administration time for this abbreviated version of the PCI Form to be approximately 5 to 7 minutes in length with the samples involved in this study.

Graham, Halpin, Harris, and Benson (1985) calculated a coefficient alpha of .94 as an estimate of reliability for this abbreviated version of the PCI Form on a sample of undergraduate

and graduate students in education. Graham, Benson, and Henry (1985) reported a coefficient alpha of .71 for this same abbreviated scale with a sample of teachers at the primary and intermediate levels. They contend that the differences in these two estimates of internal consistency are probably due to the fact that the sample in their study was comparatively smaller and more homogeneous in nature.

Samples Of Preservice And Inservice Teachers

Every reliability coefficient should be accompanied by a full description of the type of group on which it was determined (Anastasi, 1988). Therefore, the following paragraphs contain detailed demographic information regarding the various samples that participated in this investigation.

Two different samples of preservice teachers (N=168) were involved in this study. The first sample of preservice teachers (N=96) consisted of subjects taking the same undergraduate course in teacher education at a private postsecondary institution in south Florida during the 1995 fall semester, 1996 spring semester, 1996 summer term, and 1996 fall semester. The majority of these subjects were female (89%), and the average age of this sample was 26 years. Regarding ethnic/racial background, 59% of these subjects were Latin/Hispanic, 21% were African-American, 18% were Caucasian, and 2% were Asian. In terms of college class rank, 4% of this sample were freshmen, 8% were sophomores, 53% were juniors, and 35% were seniors. Eighty-six percent (86%) of these subjects were majoring in elementary education and 14% in secondary education with a noneducation area of concentration. Concerning highest educational level attained, 43% of these subjects had previously earned a high school degree, 53% an associate degree, and 4% a bachelor's degree. Eighty-one percent (81%) of this sample were planning to someday teach at a public school, with 79% of them hoping to teach at the elementary school level, 6% at the middle school level, and 15% at the high school level. Finally, 98% of these subjects were undergraduate preservice teachers, while 2% were preservice teachers with at least a bachelor's degree but with no previous professional teaching experience and currently working on initial teacher certification.

The second sample of preservice teachers (N=72) was made up of subjects taking the same undergraduate course in teacher education at a public postsecondary institution in south Florida during the1995 fall semester, 1996 spring semester, and 1996 fall semseter. Most of these subjects were female (78%), and the average age of this sample was 30 years. Concerning ethnic/racial background, 64% of these subjects were Caucasian, 27% were African-American, and 9% were Latin/Hispanic. In terms of college class rank, 11% of this sample were freshmen, 48% were sophomores, 31% were juniors, and 10% were seniors. Seventy percent (70%) of these subjects were majoring in elementary education, 24% in secondary education with a noneducation area of concentration, and 6% in special education. Regarding highest educational level attained, 54% of these subjects had previously earned a high school degree, 32% an associate degree, 11% a bachelor's degree, and 3% a master's degree. Eighty-two percent (82%) of this sample were planning to someday teach at a public school, with 80% of them hoping to teach at the elementary school level, 10% at the middle school level, and 10% at the high school level. Finally, 86% of these subjects were undergraduate preservice teachers, while 14% were preservice teachers with at least a bachelor's degree but with no previous professional teaching experience and currently working on initial teacher certification.

Two different samples of inservice teachers (N=86) participated in this investigation. The first sample of inservice teachers (N=42) consisted of subjects taking the same undergraduate course in teacher education at a private postsecondary institution in south Florida during the 1995 fall semester, 1996 spring semester, 1996 summer term, and 1996 fall semester or taking the same graduate level course during the 1995 fall semester, 1996 spring semester, and 1996 fall semester. The majority of these subjects were female (79%), and the average age of this sample was 33 years. Regarding ethnic/racial background, 58% of these subjects were Latin/Hispanic, 25% were African-American, and17% were Caucasian. In terms of highest educational level attained, 90% of these subjects had earned a bachelor's degree, 5% of them had earned a master's degree, and 5% of them had earned a doctorate. In addition, 35% of these subjects had earned a bachelor's degree in an area other than education. Concerning school level, 56% of these subjects worked in an elementary school, 9% in a middle school, and 35% in a high

school. Seventy-one percent (71%) of this sample were employed within a public school setting. Finally, their years of professional teaching experience ran from a low of less than 1 year to a high of 37 years with the average number of years of such experience being 9.05 years.

The second sample of inservice teachers (N=44) consisted of subjects taking the same undergraduate course in teacher education at a public postsecondary institution in south Florida during the 1995 fall semester, 1996 spring semester, and 1996 fall semseter. Most of these subjects were female (65%), and the average age of this sample was 32 years. Regarding ethnic/racial background, 56% of these subjects were Caucasian, 20% were African-American, 20% were Latin/Hispanic, and 4% were Asian. In terms of highest educational level attained, 73% of these subjects had earned a bachelor's degree, while 27% of them had earned a master's degree. Furthermore, 89% of these subjects had earned a bachelor's degree in an area other than education. Concerning school level, 30% of these subjects worked in an elementary school, 38% in a middle school, and 32% in a high school. Eighty-one percent (81%) of this sample were employed within a public school setting. Finally, their years of professional teaching experience ran from a low of less than 1 year to a high of 26 years with the average number of years of such experience being 3.62 years.

Data Collection Procedures

This author administered the abbreviated version of the PCI Form directly to the subjects as a group during class time. All of the subjects chose to participate in this study on an anonymous and a voluntary basis with no incentives provided. It was conveyed to the subjects that their participation in this investigation would have no bearing upon their final evaluation within the courses involved. In addition to this particular instrument, other separate scales measuring constructs such as attitudes toward student and/or teacher rights, dogmatism, teacher efficacy, and atttitudes regarding corporal punishment were administered concurrently at times. No more than two of the aforementioned scales were presented to the subjects, along with the abbreviated version of the PCI Form, at any one given time.

McMillan (1992) states that if several measures are given at the same time, the order of their administration should not be the same for all subjects. This procedure is called counterbalancing the instruments. Counterbalancing was accomplished within this study by making the abbreviated version of the PCI Form the first measure responded to by some subjects, the second instrument responded to by other subjects, and at times the third scale responded to by still other subjects.

Gall, Borg, and Gall (1996) point out that measurement error, leading to lower reliability, may be introduced into a study by failing to administer a test consistently. Salvia and Ysseldyke (1991) state that variation in the testing situation introduces an indeterminate amount of error and, in doing so, lowers reliability. Mitchell and Jolley (1992) advise to keep the testing environment the same from one data gathering session to the next and to administer the scale in question in the same way everytime.

Therefore, in order to enhance reliability every effort was made to establish standard conditions of data collection for each particular sample involved. For the preservice teachers attending the private postsecondary institution, the abbreviated version of the PCI Form was typically administered during the first class meeting, while for their inservice teacher counterparts this administration commonly took place either during the first class meeting or around the mid-point of the academic term. For the preservice and inservice teachers attending the public postsecondary institution, the abbreviated version of the PCI Form was usually administered to both samples together around the mid-point of the academic term. Furthermore, during each administration of this measure the author gave the same exact directions to the subjects regarding responding to this instrument.

Primary Findings

Regarding the sample of preservice teachers attending the private postsecondary institution, a Cronbach's alpha of .61 was computed based upon the true standard deviation of this distribution. In terms of proportions of variance, this coefficient indicates that 61% of the variance in observed scores is due to true score variance, while the remaining 39% of test score variance is due

to random measurement error. Using the Spearman-Brown prophesy formula, the effect of doubling this scale back to its original length was estimated to result in an alpha coefficient of .76. The standard error of measurement for this sample was 3.02.

For their inservice teacher counterparts at this private postsecondary institution, a coefficient alpha of .70 was calculated based upon the true standard deviation of this distribution. In terms of proportions of variance, this coefficient indicates that 70% of the variance in obtained scores reflects true score variance, while 30% of test score variance is due to random errors in measurement. Employing the Spearman-Brown prophesy formula, the effect of doubling this instrument back to its original length was estimated to result in an alpha coefficient of .82. This sample had a standard error of measurement of 3.15.

Concerning the sample of preservice teachers attending the public postsecondary institution, a Cronbach's alpha of .74 was computed based upon the true standard deviation of this distribution. In terms of proportions of variance, this coefficient indicates that 74% of the variance in observed scores is due to true score variance, while the remaining 26% of test score variance is due to random measurement error. Utilizing the Spearman-Brown prophesy formula, the effect of doubling this scale back to its original length was estimated to result in an alpha coefficient of .85. The standard error of measurement for this sample was 2.84.

For their inservice teacher counterparts at this public postsecondary institution, a coefficient alpha of .70 was calculated based upon the true standard deviation of this distribution. In terms of proportions of variance, this coefficient indicates that 70% of the variance in obtained scores reflects true score variance, while 30% of test score variance is due to random errors in measurement. Applying the Spearman-Brown prophesy formula, the effect of doubling this instrument back to its original length was estimated to result in an alpha coefficient of .82. This sample had a standard error of measurement of 3.33.

Ancillary Findings

In terms of ancillary findings on the abbreviated version of the

PCI Form, the sample of preservice teachers attending the private postsecondary institution had a median score of 29.00, a mean score of 28.52, and a standard deviation of 4.84. The highest raw score was 39.00, the lowest raw score was 18.00, and the range was 21.00. The distribution of observed scores for this sample was both platykurtic and negatively skewed. These subjects had a median score of 2.00 on four items, a median score of 3.00 (Undecided) on four items, and a median score of 4.00 on two items. The average mean score for each item was 2.85 with an average item standard deviation of 1.03.

The sample of inservice teachers attending the private postsecondary institution had a median score of 27.00, a mean score of 27.21, and a standard deviation of 5.75. The highest raw score was 39.00, the lowest raw score was 12.00, and the range was 27.00. The distribution of obtained scores for this sample was both positively skewed and platykurtic. These subjects had a median score of 2.00 on six items, a median score of 3.00 (Undecided) on one item, and a median score of 4.00 on three items. The average mean score for each item was 2.72 with an average item standard deviation of 1.10.

The sample of preservice teachers attending the public postsecondary institution had a median score of 28.00, a mean score of 28.08, and a standard deviation of 5.58. The highest raw score was 43.00, the lowest raw score was 15.00, and the range was 28.00. The distribution of observed scores for this sample was both platykurtic and positively skewed. These subjects had a median score of 2.00 on six items, a median score of 3.00 (Undecided) on one item, and a median score of 4.00 on three items. The average mean score for each item was 2.81 with an average item standard deviation of 1.02.

Finally, the sample of inservice teachers attending the public postsecondary institution had a median score of 30.00, a mean score of 29.71, and a standard deviation of 6.09. The highest raw score was 46.00, the lowest raw score was 12.00, and the range was 34.00. The distribution of obtained scores for this sample was both negatively skewed and platykurtic. These subjects had a median score of 2.00 on four items, a median score of 2.50 on one item, a median score of 3.00 (Undecided) on two items, and a median score of 4.00 on three items. The average mean score for each item was 2.97 with an average item standard deviation of 1.17.

An one-way analysis of variance (ANOVA) was used to see if statistically significant differences existed among the four different samples regarding their mean scores on the abbreviated version of the PCI Form. A F ratio of 1.58 was computed and was found not to be statistically significant at the .05 level (Numerator Degrees of Freedom=3; Denominator Degrees of Freedom=250; Approximate Value of F Required for Significance at the .05 Level=2.65). Although no statistically significant differences were found, inservice teachers from the public postsecondary institution had the highest mean PCI Form score (29.71), followed in descending order by preservice teachers from the private postsecondary institution (28.52), the preservice teachers from the public postsecondary institution (28.08), and finally the inservice teachers from the private postsecondary institution (27.21).

Discussion

On the abbreviated version of the PCI Form, preservice teachers attending the private postsecondary institution had a Cronbach's alpha of .61, while their inservice teacher counterparts had a coefficient alpha of .70. On this same version of the PCI Form, preservice teachers attending the public postsecondary institution had a Cronbach's alpha of .74, while their inservice teacher counterparts had a coefficient alpha of .70. A question that naturally arises is, "Do these reliability coefficients meet the minimum reliability that is acceptable?" Mason and Bramble (1997) remind us that there are no hard-and-fast rules about satisfactory levels of test reliability. Thus the answer varies according to the authority cited.

On the one hand, typical reliability coefficients for attitude scales are around .79 (Helmstadter, 1964) or about .80 (Sprinthall, 1994). Gall, Borg, and Gall (1996) contend that in general instruments that yield scores with a reliabity of .80 or higher are sufficently reliable for most research purposes. Regarding Cronbach's alpha coefficient, a score over .70 is seen as being acceptable (Leedy, 1997). Thus according to the first three sources cited, none of the four coefficient alphas generated by this study would be considered satisfactory, while for the last authority mentioned, i.e., Leedy (1997), only the Cronbach's alpha of .74 for the preservice teacher sample at the public postsecondary institution would be regarded as acceptable.

On the other hand, if test scores are to be used for administrative purposes and are reported for groups of individuals, a reliability coefficient of .60 should probably be the minimum (Salvia & Ysseldyke, 1991). McMillan (1992) contends that coefficients below .60 generally indicate inadequate or at least weak reliability, but studies of groups can tolerate a lower reliability coefficient, sometimes as low as .50, in exploratory research. For groups of subjects of about 25 or more scales with reliability coefficients as low as .50 can be serviceable (Patten, 1997). Finally, Thorndike (1997) states that an instrument with relatively low reliability will permit us to make useful studies of and draw dependable conclusions about groups, especially groups of substantial size. Thus according to these authorities just cited all four of the coefficient alphas generated by this investigation would be considered satisfactory or acceptable.

Regarding the question, "Is the abbreviated version of the PCI Form as reliable an instrument as the original version?", based upon the results of this study the answer would tend to be answered in the negative. As previously discussed, past research with preservice teachers resulted in a mean reliability coefficient of .77 on the original version of the PCI Form. However, the reliability coefficients for both samples of preservice teachers in this investigation, especially those from the private postsecondary institution, were found to be noticeably below that average. Prior research with inservice educators resulted in a mean reliability coefficient of .85 on the original version of the PCI Form. On the other hand, both reliability coefficients for the samples of inservice teachers in this study were discovered to be considerably below that average.

In actuality this should not be a surprising discovery when one considers that all else being equal, shorter tests have lower reliability than longer tests because they are smaller samples of behavior and are more likely to be affected by measurement error (Friedenberg, 1995). As the length of an instrument is increased, chance errors of measurement more or less cancel out, the observed score comes to depend more and more completely on the characteristics of the person being measured, and a more accurate appraisal of the individual is thus obtained (Thorndike, 1997). Furthermore, the number of items on a scale increases the potential variability of scores, and increased group variability is positively related to greater reliability (Kubiszyn & Borich, 1993).

On the other hand, this author discovered that none of the reliability coefficients on the abbreviated version of the PCI Form obtained in this study came close to the coefficient alpha of .94 that Graham, Halpin, Harris, and Benson (1985) found with this same measure. This is somewhat surprising when one considers that a coefficient alpha of .71 for this same abbreviated version of the PCI Form reported by some of the same authors in another study, i.e., Graham, Benson, and Henry (1985), is much more in line with three of the four reliability coefficients found in this investigation. Probably the reasons for such a major discrepancy in these reported reliability coefficients are due to the fact that the samples used in this study were smaller in number and were less heterogeneous than the sample used by Graham, Halpin, Harris, and Benson (1985) in their research.

Prior research with the original PCI Form has consistently shown that preservice teachers' and inservice educators' pupil control ideologies tend to become significantly more custodial with increased teaching experience (Brenneman, Willower, & Lynch, 1975; Harty, Andersen, & Enochs, 1984; Helsel, 1971b; Hoy, 1967; Hoy, 1968; Hoy, 1969; Hoy & Woolfolk, 1990; Jones, 1982; Jones & Harty, 1980; Killian & McIntyre, 1986; Lunenberg, 1984; Roberts & Blankenship, 1970; Willower, 1969; Willower, 1975; Willower, Eidell, & Hoy, 1967; Willower & Jones, 1963; Willower & Landis, 1970; Yuskiewicz & Willower, 1973). This is seen as being primarily due to the fact that teacher socialization results in the eventual adoption of a less humanistic pupil control orientation (Hoy, 1968). However, as previously discussed, on the basis of an one-way ANOVA no statistically significant differences existed among the samples of preservice and inservice teachers involved in this investigation regarding their mean scores on the abbreviated version of the PCI Form. This finding should not be too surprising when one keeps in mind that it is generally more difficult to find significant differences between/among groups with instruments that have relatively and comparatively low reliability to begin with (McMillan, 1992). In other words, measures with low reliabiity will weaken the power of tests of statistical significance (Gall, Borg, & Gall, 1996).

Upon an examination of the findings from this study, the following question also arises, "Why was the Cronbach's alpha of the preservice teachers attending the private postsecondary institution

(.61) so much lower than the coefficient alphas of the other samples, especially of fellow preservice teachers attending the public postsecondary institution (.74)?" To begin with the preservice teachers from the private institution had the lowest standard deviation (4.84) of any of the other samples. A distribution of scores with a restricted spread or range of scores indicates that the sample in question is homogeneous in nature. Homogeneous samples, which have little variability or dispersion in scores, not only have smaller standard deviations (Sprinthall, 1994) but also have lower reliability coefficients as well (Drummond, 1996). Reliability is thus a function of the heterogeneity or homogeneity of a sample on the particular trait that is being measured (McMillan, 1992).

Another reason for the relatively lower Cronbach's alpha of the preservice teachers attending the private postsecondary institution centers around the concept of skewness. Using a method for assessing skewness found in Sprinthall (1994), i.e., mean - median = skewness, this sample was found to have by far the highest degree of skewness (-.48) when compared to the inservice teachers from the private postsecondary institution (+.21), the preservice teachers from the public postsecondary institution (+.08), and the inservice teachers from the public postsecondary institution (-.29). With highly skewed distributions it is normally difficult to obtain high estimates of reliability (McMillan, 1992).

Finally, based upon the 13 reliability coefficients reported in this investigation, an average coefficient of .81 was computed for the original version of the PCI Form with both preservice teachers and inservice educators. However, based upon the six coefficient alphas presented in this study on the abbreviated version of the PCI Form an average Cronbach's alpha of .73 was calculated for preservice teachers, inservice teachers, and graduate students in education. Therefore, this author is of the opinion that whenever it is possible the original version of the PCI Form should be used in research situations, as opposed to the abbreviated version of this same instrument, due to its greater overall reliability with such populations. However, when a researcher is interested in using the PCI Form concurrently with several other measures on the same subjects, then he/she may want to consider using the abbreviated version of the PCI Form because of its overall satisfactory levels of reliability and the less amount of time involved in its administration.

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APPENDIX A

The Abbreviated Version Of Form PCI

Introduction: On the following pages a number of statements about teaching are presented. The purpose is to gather information regarding the actual attitudes of educators concerning these statements. You will recognize that the statements are of such a nature that there are no correct or incorrect answers, and you can be sure that there are others who would hold viewpoints similar to yours. I am interested only in your frank opinion of them.

Instructions: The following are ten statements about schools, teachers, and pupils. After reading each statement please place a check mark ( ) next to one of the five responses which best describes your personal point of view. Please respond to every statement. Please do not write your name on these sheets. Thank you in advance for your cooperation.

Code: Strongly Agree = SA
Agree = A
Undecided = U
Disagree = D
Strongly Disagree = SD

1. Too much pupil time is spent on guidance and activities and too little on academic preparation.
SA _____ A _____ U _____ D _____ SD _____

2. Being friendly with pupils often leads them to become too familiar.
SA _____ A _____ U _____ D _____ SD _____

3. It is more important for pupils to learn to obey rules than that they make their own decisions.
SA _____ A _____ U _____ D _____ SD _____

4. Student governments are a good "safety valve" but should not have much influence on school policy.
SA _____ A _____ U _____ D _____ SD _____

5. Pupils can be trusted to work together without supervision.
SA _____ A _____ U _____ D _____ SD _____

Code: Strongly Agree = SA
Agree = A
Undecided = U
Disagree = D
Strongly Disagree = SD

6. If a pupil uses obscene or profane language in school, it must be considered a moral offense.
SA _____ A _____ U _____ D _____ SD _____

7. A few pupils are just young hoodlums and should be treated accordingly.
SA _____ A _____ U _____ D _____ SD _____

8. It is often necessary to remind pupils that their status in school differs from that of teachers.
SA _____ A _____ U _____ D _____ SD _____

9. Pupils cannot perceive the difference between democracy and anarchy in the classroom.
SA _____ A _____ U _____ D _____ SD _____

10. Pupils often misbehave in order to make the teacher look bad.
SA _____ A _____ U _____ D _____ SD _____